10 Molecular Biology of the Gene

Teaching Objectives

Introduction: Explain how a herpesvirus invades a cell and forces the cell to reproduce the virus.

The Structure of the Genetic Material

10.2–10.3 Compare the structure of DNA and RNA.

DNA Replication

10.4 Explain how the structure of DNA facilitates its replication.

10.5 Describe the process of DNA replication.

The Flow of Genetic Information from DNA to RNA to Protein

10.6 Describe the locations, reactants, and products of transcription and translation.

10.7–10.8 Explain how the “languages” of DNA and RNA are used to produce polypeptides.

10.9 Explain how RNA is produced.

10.10 Explain how eukaryotic RNA is processed before leaving the nucleus.

10.11 Explain how tRNA functions in the process of translation.

10.12 Describe the structure and function of ribosomes.

10.13 Explain how translation begins.

10.14 Describe the step-by-step process by which amino acids are added to a growing polypeptide chain.

10.15 Diagram the overall process of transcription and translation.

10.16 Describe the major types of mutations and their possible consequences.